BIBLIOGRAPHICAL NOTICES.

Rare and Remarkable Animals of Scotland, represented from living Subjects; with Practical Observations on their Nature. By Sir John Graham Dalyell, Bart. Volume second, containing fifty-six coloured Plates. London: John Van Voorst, 1848. 4to.

We have to apologize to our readers for our dilatoriness in introducing to their notice this second volume of a very remarkable work, whose speedy appearance we hail with much pleasure. The volume is equal to the first in its bulk and fair proportions, but scarcely equal in the interest and marvellousness of its histories; and indeed the author has been anticipated, if we mistake not, in the publication of his most curious discoveries, although certainly not in the finding of them. He has been long in the possession of a knowledge of certain phænomena touching the lives of these inferior animals, which, subsequently ascertained by younger investigators less patient of their gestation, got speedy air and publicity; and hence discoveries which are original in themselves and of singular interest, appear as second-hand and wanting in effect on their now publication. In illustration and proof of this we may instance the discovery of the metamorphosis of the compound and solitary Tunicata—their oviparous character—the tadpole similitude of their larvæ—their locomotive power and subsequent fixation—the diffluence of each larva on the foreign object to be its future residence—and its gradual mutation to the parent form. This discovery is here fully explained and illustrated from personal observation, and we know that it has been long the author's own; but naturalists have become familiar with it, not through his works, but through the popular writings of Milne-Edwards, translated and transferred into every work compiled to meet the demand for elementary books on zoology.

The first chapter treats of "Foliaceous Zoophytes," or *Flustræ*. At the very outset Sir John tells us that each polype, in the multitudinous polypidom, lives "solely for itself, independent of the life, the death, and the circumstances of its nearest neighbour. Among the multitudes restricted to limited space, we discover no reciprocal bond or connexion, nor any common channel of communication between them; neither any internal pith or medullary substance pervading the polyparium." (p. 1.) But subsequently he arrives at the sounder conclusion that, though no connexion or communication between the cells of the *Flustra* can be discovered, "there is a strong presumption of some imperceptible channel or medium traversing the leaf, whereby portions with new hydræ are generated from the older parts." (p. 13.) The polypidom holding in its entirety myriads of individuals begins always with one only cell; and this, to secure a broader foundation for the future colony, is always horizontal, while those which pullulate from it are, and must necessarily be, vertical. The original dies and consolidates, and so do its immediate successors, after producing others above them, which are ejected from their living progenitors in regulated ordination,

each after its kind. We have the early stages of one or two species distinctly traced; and there is a very good account of their ciliated ova.

The chapter is illustrated with eight plates, representing *Flustra carbasea, foliacea* and *truncata*. The *Fl. papyracea* represented in plate 7 is very unlike any specimen of the species we have seen, and we are inclined to think it no other than a variety of *Fl. foliacea*. Plate 8 represents not solely *Flustra Murrayana*, but, as we would conjecture, three species; viz. fig. 1. *Cellularia avicularia*; fig. 2. probably *Flustra Murrayana*; and fig. 6. certainly *Flustra avicularis*.

Chapter 2 treats of "Investing Ascidian Zoophytes," and has three illustrative plates. The first of them (pl. 9) represents *Flustra hispida* remarkably well; and the species is well described in the letter-press. The polype has about thirty-five tentacula. "None of the marine ascidian hydræ have shown me a complement alike numerous. This animal is likewise among the larger species, being about a line and a half in height, and the tentacula composing its cell expanding nearly as much. Its form is elegant, light and beautiful. It rises very leisurely and gradually from the cell; but its retreat is most precipitate, vanishing in a moment." (p. 30.) The ovum has the same origin and properties as that of *Flustræ* generally, but it is quite different in shape from any of them: it is "pure white, elliptical, thin, and fringed by a border of active cilia,—all which renders it a beautiful object under the microscope." This peculiar figure of the ovum, taken in conjunction with the peculiar substance of the polypidom, would vindicate the claim of the production to be the type of a new genus.

Alcyonidium parasiticum (pl. 10) is equally well figured and described. Plate 11 illustrates a new species named *Alcyonidium mytili*, from its infesting chiefly the shells of the mussel. The species would have been better placed apparently in the genus *Flustra*. "It appears as a small spot, or spreads over a superficial area of various extent, until equalling 2 or 3 inches, according to the specimen. The diffusing edge is always curvilinear, the patch of dingy white, and seldom thicker than writing-paper." "The upper surface is soft, wholly composed of numerous cells, apparently with an elliptical orifice; and the lower or deeper part polyangular. However, the exact form of the adult is not to be easily discovered; and, in general, the real figure of the cell seemed to me to be hexagonal." (p. 36.) We suspect this is the same thing as the *Flustra Peachii* of Couch.

The "*Alcyonium*" is the subject of Chapter 3. Plates 12, 13, 14 and 16 illustrate the multiform character of *A. gelatinosum*; plate 15 is a characteristic figure of *A. hirsutum*, here named *A. palmatum*; and the various figures in plate 17 are referable to the same species.

Chapter 4 is entitled "Miscellaneous Zoophytes." The first of them described is *Hydra* (*Coryna*) *squamata*, pl. 18. figs. 1–10; but the species is misnamed, for it is really the *Hydractinia echinata*. It is well described, excepting in so far that the author seems to mistake its muricated basis for the epidermis of the shell on which the zoophyte has grown. The efforts of Sir John to breed the animal were

only partially successful, but it appears that the ova, after their discharge from the external and naked bulbules, do not enter into medusiform larvæ, but develope at once into the hydraform condition of the parent.

The figs. 1–6 of plate 19 represent *Sertularia thuia*. The 20th plate is dedicated to the *Pedicellina*, but the figures tell less of its structure than do those of Hassall and Van Beneden. We may quote the general description of the species (*P. nutans*=*P. gracilis*, Sars), which is also applicable to *P. echinata*, not distinguished from the preceding by our author. "In an early stage it appears as a white globular head, crowning a short stem, one scarcely half a line high. When more advanced, it generally occurs, or, perhaps, more readily attracts notice, when in numerous colonies of individuals rising about a line and a half. Then it consists of a smooth white stem, crowned by a variable campanulate hydra, with fourteen ciliated tentacula. The stem of certain specimens has appeared prickly, sometimes invested by foreign matter; and I have thought a web uniting the roots of the tentacula discernible.

"At this stage the *Pedicellina* generally dwells in numerous societies, implanted on the twigs of other zoophytes, or distributed profusely over shells.

"The adult rises half an inch in height by a smooth bare stem, with twenty or a greater number of hydræ, meagrely and irregularly disposed on branches or pedicles to right and left, on one or on both sides. But such luxuriance is very rare. Among a multitude of specimens I have seldom found any with even a few animals.

"It is only in early stages, when the hydra is solitary, that it can be most satisfactorily inspected. Then, the head is discovered to be of an extremely variable shape, frequently distorted in an uncommon manner,—such as I have not seen in any other zoophyte,—and next restored to its symmetry. Sometimes it is flattened, or it is preternaturally enlarged on one side, swollen, contracted, or otherwise, at the will of the animal; and always presenting considerable diversity of aspect, either by one or by the various specimens of a colony." (p. 60.) The author notices a singular habit in the species. He says, "Though quiescence always prevails during the earlier part of the day, among a colony of single animals, that is, those consisting of only a head and stem, all are observed in motion as the hours advance, and as the sun begins to decline. The tentacula closing over the mouth, the heads become globular, nod, and strike against each other, which they are enabled to do by flexibility of the stalk. Where many are arranged in a row, they seem literally to pass a blow along the whole line, as if in sport. Singular it is, that all animals, even the humblest, seem to have moments happier than others of their existence; and testify, by unequivocal demonstration, their present enjoyments in conscious security." (p. 62.)

Sir John goes on to describe *Tubularia sultana* = *Fredericella sultana*, and *Avenella fusca*, a hitherto unnoticed ascidian zoophyte parasitical on other zoophytes, &c. These species are figured in the first volume. Another new ascidian zoophyte he names Triticella *flava*,

pl. 19. fig. 7, which differs from all others of its family in every individual being distinct of itself. It is the cell of a *Vesicularia* without the composite character produced by a connecting stem or tube; and the single ovate cell is simply supported on a short pedicle about half its length. The polype has the usual structure of the ascidians, and is furnished with twenty tentacula. The specimens were found on the envelope of an ascidia.

Crisia eburnea occupies rather uselessly a large portion of plate 19; and two plates are devoted to *Coryna glandulosa*, the plate 22 representing a specimen with a very peculiar aspect, in which it is difficult to trace the characters of the species.

"Calcareous Zoophytes" are embraced in Chapter 5. The species noticed with more or less detail are *Flustra membranacea*, *Lepralia pustulosa*, *edentata*, *punctata*, *nitida*, *lineata*, *margarita*, *spinosa*, *trispinosa* and *squama*, *Cellepora cingens*, *pumicosa*, *ramulosa* and *iris*, *Membranipora pilosa* and *Tubipora serpens*. Several of these names are new to the British zoologist, but whether they designate new species is somewhat uncertain, for Sir John Dalyell never uses a specific character, which, in our opinion, every new species ought to have, and that neatly and curtly defined so as only to embrace its own peculiarities. The lengthy characters now so much in use are comparatively useless, and bespeak feebleness in the authors of them. *Lepralia pustulosa* seems new, and is characterized by a circle of minute tubercles around the base of each cell which is raised with a plain circular aperture; of *L. edentata* we can say nothing; Sir John's *L. punctata* is the *L. variolosa*, Johnst., nor are we satisfied that his *L. lineata* is distinct from it. *Lep. margarita* embraces more than one species, one of them being apparently *L. ciliata*, or perhaps the ovarian capsules only of a species whose cells have been obliterated. *Lep. spinosa* is *Lep. immersa*, Johnst.; but neither the description nor figure enables us to characterize the *Lep. squama*. *Cellepora cingens* is new to us; but the *C. iris* seems to be nothing but a small specimen of *C. Skenei*, Flem.

Chapter 6 is the most interesting in the volume. It embraces the "Lunate ascidian zoophytes—*Cristatella*, *Alcyonella*, *Plumatella*," which are beautifully illustrated and admirably described. The figures of the *Cristatella* have really surprised us, and exhibit an animal curious beyond imaginative creations. We shall seek for it carefully to satisfy the curiosity which Sir John has raised by his pen and pencil. "Among the zoophytes of the fresh waters of Scotland," says our author, "this is perhaps the most remarkable of all. The features by which it is distinguished belong to none of the rest, nor, it may be, to any other known animal of the universe." (p. 89.) The history of it is very complete, but it must be read as a whole to be properly appreciated.

Equally complete and interesting is the history of the *Alcyonella*, but we are not aware that any of the facts are unknown to naturalists. Two plates are appropriated to its illustration; and Sir John attempts to define two species of the genus—the *A. stagnorum* and *A. gelatinosa*, and a nameless third one is indicated. The author

admits that further observations are required to prove their distinctness. The characters of the two named may be thus expressed:—

Al. stagnorum, *mass gray, polypes with* 42–44 *tentacula.*

Al. gelatinosa, *mass yellowish or gray, polypes with* 70 *tentacula.*

Of the *Plumatella* we may confidently assert, that the history and figures given by our author are very superior to any hitherto published. His observations go to prove the distinctness of *Plumatella* as a genus, but he has seen only one species, the variations of which are not so prominent as to constitute them different in kind: "the reciprocal resemblance of specimens to each other is not so striking as at once to prove identity, though enough to establish kindred." (p. 124.) The tentacula vary apparently from about fifty to seventy, and Sir John says that the number certainly augments with age.

Chapter 7 is devoted to "Ascidia." We must content ourselves with a mere indication of the species described. 1. *Ascidia villosa* = *Pelonaia corrugata*, Forb. 2. *As. intestinalis*, a species not described by Forbes and Hanley. 3. *As. rustica* = *As. scabra*, Forb. and Hanl. The "young brood" of this represented on plate 35 is surely a distinct species. 4. *As. scabra* = *As. virginea*, Forb. and Hanl. 5. *As. mentula*, a rare and gigantic species. "Specimens obtained in the Orkney Islands are no less than 8 inches in height, and 3 in their widest diameter." 6. *As. papilla* = *Cynthia grossularia*, Van Beneden. This is fully described, and its mode of propagation ascertained.

"The Compound Ascidia" are described in Chapter 8, and five plates are devoted to their illustration. We cannot undertake to collate the species with those described by other authors, for the subject is difficult, and specific characters of ready apprehension have not been given anywhere. Sir John denominates one kind described by him *Botryllus verrucosus*; but he has left the others figured to be named by those who list.

Chapter 9 contains good figures of some "asteroidal zoophytes," viz. *Lobularia digitata*, *Virgularia mirabilis* and *Pennatula phosphorea*. We need scarcely add that the history of each of them is given in full and interesting detail.

The "*Actinia*" or "the Animal Flower" is the subject of Chapter 10, and the portraits of the species are exhibited in five plates. After an excellent history of the genus, the author proceeds to describe the species whose habits he has studied with so much patience and care. 1. *Actinia mesembryanthemum*. 2. *Ac. cerasum* = *Ac. chiococca*, Johnst. 3. *Ac. gemmacea* = *Ac. coriacea*. 4. *Ac. elegans*, probably a new species. 5. *Ac. explorator* = *Ac. troglodytes*, Johnst. 6. *Ac. lacerata* = *Ac. anguicoma*, Price. 7. *Ac. maculata* = *Adamsia palliata*. 8. *Ac. dianthus*.

Chapter 11 is entitled "Miscellaneous Supplementary Observations." It contains some additional remarks on the *Hydra tuba*, the story of whose singular metamorphosis formed such a charming episode in the first volume; and we have also another plate devoted to its further illustration. It may be remembered that the *Hydra tuba*, at uncertain epochs of its life, produced in succession, as from

a roll, minute medusiform young, which have been presumed to be the young of some larger and common species; but our author has never in one instance seen them undergo "the smallest sensible change," "either by organic increment, or the evolution of additional parts. They perished in the precise state wherein they were first recognized," although some specimens survived for sixty days. Sir John adds: "I have not heard that any other naturalist has been more fortunate,—that he has succeeded in preserving those component portions of the medusan roll under uninterrupted observation until some farther evolution, alteration, and increment, admitted their identification with adult animals. If this has actually been done, my ignorance of it must plead an apology for protracting the narrative. I have observed it affirmed, it is true, that older and larger Medusæ are the adults of the younger and smaller tribe now referred to. But I have not seen any demonstration of the facts, possibly owing to my very limited sphere of information." (p. 242.) In fact the additional observations of Sir John Dalyell make us doubt whether they can ever pass into larger Medusæ, any more than the medusiform larvæ of the *Campanularia* can do, but rather that it may be they should develope into the hydra-like parent, which produces these Medusæ only at uncertain intervals and under unascertained conditions.

Plate 51 contains good figures of *Medusa aurita* and *capillata*. Other species named *Medusa crinita, proboscidea*, a species of *Tima*, *Medusa fimbriata, Beroë ovata, B. punctata, B. bilobata, B. pileus*, are represented more or less fully in the plates which follow.

Plate 55 is named *Valkeria spinosa*, but it has a very peculiar aspect which puzzles us. Plate 56 is entitled "Ascidia," and we presume the species to be *A. mentula* described in a former portion of the volume; which concludes with an interesting chapter on the "Nature of Zoophytes."

First Steps to Zoology. By Robert Patterson. Simms and M'Intyre. London, 1849.

This recent addition to our stock of popular books on natural history is an abridgement of Mr. Patterson's more extended work, the 'Zoology for Schools.' Here his object has been merely to furnish the young reader with short notices of the various orders into which naturalists have divided the animal world, and in this he has fully succeeded. No more prominence is given to one portion over the others than from the nature of the subject is almost inevitable, and we think that the 'First Steps to Zoology' will be found to convey to the beginner a very fair impression of the extent of the animal kingdom, and of its great leading divisions.

The book is illustrated with a large number of woodcuts, but either from long wear or from carelessness in working, the present impressions are very inferior. This is a pity, as in all probability a little care would have prevented such an occurrence; and in the event of a second edition appearing, we hope Mr. Patterson will try whether something cannot be done to improve his book in this respect.